REMARKS

The Office Action mailed April 18, 2002, was reviewed, and pursuant thereto, Applicant initiated a telephone interview with the Examiner on July 18, 2002. Applicant appreciates the Examiner's time and consideration during the interview. During that time, Applicant proposed certain claim amendments and discussed such amendments with the Examiner. Applicant appreciates Examiner's comments with respect to such amendments.

In view of this, Applicant has amended claims 1-9, 11-17 and 20-24, as well as adding new claims 32-37. Applicant has deleted claims 10, 18-19 and 25-31. Applicant respectfully submits that the amendments to the claims, and the newly added claims, are proper, do not constitute new matter, and will not create an additional burden on the Examiner. The amendments to the claims and the newly added claims are merely to make more explicit that which was implicit, inherent or intrinsic from an overall view of the claims as originally submitted. Therefore, it is respectfully requested that such amendments to the claims, as well as the newly added claims, be entered.

CLAIMS REJECTION UNDER 35 U.S.C. § 112

In the Office Action mailed April 18, 2002, the Examiner rejected claims 4, 10-25, 30 and 31. In support of this rejection, the Examiner stated:

> 9. Claims 4, 10-25, 30 and 31 are rejected under 35 U.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly

claim the subject matter which applicant regards as the invention.

10. In claim 4, it is unclear if "the wing" refers to the "at least one wing" recited in claim 4, the "at least one wing" recited in claim 3, or the "at least one wing" recited in claim 1. The word "the" or "said" should preceded subsequent references to a claimed element. Each recitation of "at least one wing" will not be assumed to be related to any previously recited wing or wings unless a relationship is explicitly recited.

11. Dependent claims 4 and 10-25 are considered indefinite because they recite limitations without setting forth any relationship between the limitations and the apparatus of the base claim. For example, in claim 11, the stipulation "wherein at least one wing is a cambered wing" does not state whether or not such a wing is or is not part of the claimed apparatus and appears open to any wing anywhere being chambered, regardless of whether it is associated with the structural elements of the parent claim.

12. Claim 13 is further rendered indefinite by the phrase "relates to" which is vague.

13. In claim 17, it is unclear whether "the at least one wing" refers to the "at least one wing" recited in claim 16 or the "at least one wing" recited in claim 9 or the "at least one wing" recited in claim 8.

14. The further limitations of claims 18 and 19 appear to contradict parent claim 17, because claim 17 requires the chord line to be parallel to the flow, while the further limitations of claims 18 and 19 require a non-parallel angle..

15. In claim 20, it is unclear whether "the wing" refers to the "at least one wing" recited in claim 20, the "at least one wing" recited in claim 16 or the "at least one wing" recited in claim 9 or the "at least one wing" recited in claim 8.

16. The further limitations of claims 30 and 31 appear to contradict parent claim 26, because claim 26 requires the chord line to be parallel to the flow, while the further limitations of claims 30 and 31 require a non-parallel angle.

Note

17 The instant claims include numerous stipulations concerning what the claimed apparatus

> is intended to do such as generate vortices, generate lift and shed a vortex. Applicant is reminded that claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danly*, 120 USPQ 528, 531 (CCPA 1959). "Apparatus claims cover what a device is, not what a device does." *Hewlett-Packard v. Bausch & Lomb Inc.*, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) (emphasis in original).
> 18. The instant claims make several references to material intended to be acted upon by the claimed apparatus such as "combustion gas". Applicant is reminded that "Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim." *Ex parte Thibault*, 164 USPQ 66,667 (Bd. App. 1969). "Inclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims". *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

Applicant has amended all pending claims that recited "at least one" and Applicant has replaced "at least one" with "a" or "the" for purposes of clarity. Such amendments are not intended to limit or narrow the scope of the claims or in any manner impair application of the doctrine of equivalents. Applicant's amendment is provided only for the purposes of clarifying that the invention may be provided with one or more of the elements recited in claims using the words "a" or "the". Examiner's rejection with regard to claims 18-19 and 30-31 have been obviated since Applicant has cancelled these claims.

CLAIMS REJECTION UNDER 35 U.S.C. § 102

In the Office Action mailed April 18, 2002, the Examiner rejected claims 1-31. In support of this rejection, the Examiner stated:

20. Claims 1-31 are rejected under 35 U.S.C. 102(b) as being anticipated by "Selective Catalytic Reduction" (SRC) provided with the IDS of paper No. 4. Regarding claim 1, SRC discloses a system comprising a duct having an interior passageway, at least one wing in the duct, and at least one nozzle disposed within the interior passage (see Figs. on pages 2 and 3). Regarding claim 3, at least one wing disposed with the interior passageway is operable to generate lift (see Fig. on page 2; see Note above). Regarding claim 4, at least one wing is operable to shed a vortex at a point on the wing (see Fig. on page 2; see Note above). Regarding claim 5, at least one nozzle is positioned adjacent the point on a least one wing where the vortex is shed (see Fig. on page 2; see Note above). Regarding claim 6, at least one wing is suspended within the interior passage of the duct (see Figs. on pages 2 and 3). Regarding claim 7, at least one wing is attached to an inner surface of the duct and extends therefrom (see Fig. on page 3). Regarding claim 8, SCR discloses a system comprising a duct having an interior passageway, at least one wing disposed within the interior passageway and at least one nozzle disposed within the interior passageway (see Figs. on pages 2 and 3). Regarding claim 9, at least one wing disposed with the interior passageway is operable to generate lift (see Fig. on page 2; see Note above). Claims 10-25 fail to further limit the claimed structure in a meaningful way as discuss above with regard to section 112; however, for the record, a wing being a substantially symmetrical airfoil as recited in claim 10 is shown on page 2; a wing being a cambered wing as recited in claim 11 is shown on page 2; a wing being a substantially arcuate shape airfoil as recited in claim 12 is shown on page 2; an arcuate shape relating to a camber line of a camber wing as recited in claim 13 is shown on page 2; an wing being an airfoil provided with a camber line as recited in claim 16 is shown on page 2; a wing positioned within the camber line as recited in claim 16 is shown on page 2; a wing positioned within the interior passage of the duct such that a chord line define a straight line extending a distance relative to a cross section of the wing is substantially parallel to a line defining the direction of the flow of combustion gas within the interior passage as recited in claim 17 is shown on page 2; see page 2 and the rejections under section 112 regarding self contradictory claims 18 and 19; a wing operable to shed a vortex as recited in claim 20 is shown on page 2 (also see above Note), a nozzle positioned adjacent a position on a wing where a vortex is shed as recited in claim 21 is shown on page 2; a nozzle discharging a mixture in the flow as recited in claim 22 is shown on page 2 (also see above Note); a nozzle being positioned adjacent the point on a wing where a vortex is shed as recited in claim 23 is shown on page 2; a nozzle discharging the mixture as recited in claim 24 is shown on page 2 (see also above Note, direction of flow is an intended use); a nozzle positioned adjacent the point on a wing where the vortex is shed as recited in claim 25 is shown on page 2. Regarding claim 26, SCR discloses a system comprising a duct having an interior passageway; a wing having operable to generate lift positioned within the interior passageway such that a chord line defining a straight line extending a cross sectional distance of the wing is substantially

parallel to a line defining the direction of the flow, the wing operable for generating at least one vortex at a point on the wing and at a nozzle within the passageway, the nozzle operable to discharge a mixture into the vortex generated by the wing (see Figs on page 2 and 3; see above Note). Regarding claim 27, a plurality of wings are disposed within the interior passageway (see Fig. on page 3). Regarding claim 28, the plurality of wings are attached to an inside surface of the duct (see Fig. on page 3). Regarding claim 29, the plurality of wings are attached to the inner surface of the duct about a plane extending substantially perpendicular to the inner surface (see Fig. on page 3, the surface being that perpendicular to the arrow labeled "NH_3 andAir"). Claims 30 and 31 are considered to be self-contradictory as discussed above with regard to section 112; however, see Fig. on page 2 for relevant information.

21. Claims 1-31 are rejected under 35 U.S.C. 102(a & e) as being anticipated by Dohmann (US 6,135,629). Regarding claim 1, Dohmann ('629) discloses a system comprising a duct (2) having an interior passageway, at least one wing (1) in the duct, and at least one nozzle (9) disposed within the interior passage. Regarding claim 2, the nozzle is adjacent the wing (see Fig. 5). Regarding claim 3, at least one wing disposed with the interior passageway is operable to generate lift (see Fig. 5; see Note above). Regarding claim 4, at least one wing is operable to shed a vortex at a point on the wing (see abstract; see Note above). Regarding claim 5, at least one nozzle is positioned adjacent the point on at least one wing where t he vortex is shed (see Fig. 5; see Note above). Regarding claim 6, at least one wing is suspended within the interior passage of the duct (see Fig. 5). Regarding claim 7, at least one wing is attached to an inner surface of the duct and extends therefrom (see Fig. 5). Regarding claim 8, Dohmann ('629) discloses a system comprising a duct (2) having an interior passageway, at least one wing (1) disposed within the interior passageway and at least one nozzle (9) disposed within the interior passageway. Regarding claim 9, at least one wing disposed with the interior passageway is operable to generate lift (see Fig. 5; see Note above). Claims 10-25 fail to further limit the claimed structure in a meaningful way as discuss above with regard to section 112; however, the record, a wing being a substantially symmetrical airfoil as recited in claim 10 is shown in Fig. 3; a wing being a cambered wing as recited in claim 11 is shown in Fig. 3; a wing being a substantially arcuate shape airfoil as recited in claim 12 is shown in Fig. 3; an arcuate shape relating to a camber line of a camber wing as recited in claim 13 is shown in Fig. 3; a wing made of rigid sheet metal as recited in claims 14 and 15 is disclosed in col. 4, line 54-61; a wing being an airfoil provided with a camber line as recited in claim 16 is shown in Fig. 3; a wing positioned within the interior passage of the duct such that a chord line define a straight line extending a distance relative to a cross section of the wing is substantially parallel to a line defining the direction of the flow of combustion gas within the interior passage as recited in claim 17 is shown in Fig. 5; see Fig. 5 and the rejections under section 112 regarding self contradictory claims 18 and 19; a wing operable to shed a vortex as recited in claim 20 is described in the abstract

(also see above Note), a nozzle positioned adjacent a position on a wing where a vortex is shed as recited in claim 21 is shown in Fig. 5; a nozzle discharging a mixture in the flow as recited in claim 22 is shown in Fig. 5 (also see above Note); a nozzle being positioned adjacent the point on a wing where a vortex is shed as recite in claim 23 is shown in Fig. 5; a nozzle discharging the mixture as recited in claim 24 is shown in Fig. 5 (see also above Note, direction of flow is an intended use); a nozzle positioned adjacent the point on a wing where the vortex is shed as recited in claim 25 is shown in Fig. 5. Regarding claim 26, Dohmann ('629) discloses a system comprising a duct (2) having an interior passageway; a wing (1) having operable to generate lift positioned within the interior passageway such that a chord line defining a straight line extending a cross sectional distance of the wing is substantially parallel to a line defining t he direction of the flow, the wing operable for generating at least one vortex at a point on the wing and at a nozzle within the passageway, the nozzle operable to discharge a mixture into the vortex generated by the wing (see Fig. 5 and see above Note). Regarding claim 27, a plurality of wings are disposed within the interior passageway (see Figs. 8a-8c). Regarding claim 28, the plurality of wings are attached to an inside surface of the duct (see Fig. 5). Regarding claim 29, the plurality of wings are attached to the inner surface of the duct about a plane extending substantially perpendicular to the inner surface (see Fig. 5 and Figs. 8a-8c). Claims 30 and 31 are considered to be self-contradictory as discussed above with regard to section 112; however, see Fig. 5 for relevant information.

While claims 14 and 15 are rejected under section 102 as anticipated by SCR rather than under section 103, this is because the limitations "constructed of a substantially rigid material" (claim 14) and the "rigid material is sheet metal" (claim 15) do not modify any positively recited structural element. If the claims were amended so that these limitations modified a positively recited wing, claim 14 would be rejected under section 103 because it would have been obvious to one of ordinary skill in the art to have used substantially rigid material to withstand the flow of the flue gas. Claim 15 would also be rejected under section 103 because it would have obvious to one of ordinary skill in the art to have used sheet metal to withstand the high temperatures disclose (570-750 F, page 3, col. 2, lines 1-2). See Dohmann (US 6,135,629), col. 4, lines 54-61 for a teaching of rigid sheet metal wings in ducts for mixing ammonia into flue gas.

Applicant respectfully submits that the "Selective Catalytic Reduction" (SRC) reference discloses a disc or plate provided with an angled "roof-top" upper surface configuration and a flat lower surface. (SRC, Page 2-3). U.S. Patent No. 6,135,629 to Dohmann discloses "a flat

trapezium" with "straight bends in the edges". ('629, col.3, lines 24-26).

Applicant has amended claim 1 to clarify that the wing is curved by the amendment that "the wing arced between a leading edge and a trailing edge of the wing".

Providing an arced wing, as in claim 1, provides the advantage of being able to control the aeronautic characteristics of the wing such as where the vortex will shed on the wing, the intensity of the vortex and improved lift characteristics under varying scenarios. One objective of the present invention is to provide improved mixing of injection fluid with the combustion gas. An arced wing provides greater predictability and control of the vortices resulting in improved distribution of the mixture with the combustion gas.

Applicant respectfully submits that the angled "roof-top" upper surface and flat lower surface configuration of the SRC and the '629 disclosure of a flat plate with straight bends are not a wing arced between a leading edge and a trailing edge of the wing as claimed in Applicant's claim 1. Furthermore, the SRC and '629 reference are incapable of achieving the aeronautic advantages of Applicant's invention.

Applicant submits that the SRC and '629 references, neither alone nor in combination, teach, disclose or even suggest Applicant's claimed invention. For this reason, Applicant requests the Examiner to reconsider and withdraw the rejection of claim 1 under 35 U.S.C. § 102 and pass claim 1 to issue.

With respect to the Examiner's reasons for rejection of claims 2-7, Applicant respectfully submits that claims

2-7 provide additional points of novelty and include all the limitations of base claim 1 and any intervening claims, which, for the reasons stated above and incorporated herein by reference, include limitations that are not disclosed in the SRC or '629 references cited by the Examiner. For this reason, Applicant respectfully submits that claims 2-7 are not anticipated and requests that the Examiner withdraw the rejection based on 35 U.S.C. § 102 and pass these claims to issue.

With regard to Claim 8, Applicant respectfully submits that the plate or disc of the SCR and the '629 references are placed at an angle of attack of approximately over 45 degrees relative to a line parallel to the side of the duct and in the direction of travel of the combustion gas. Applicant was the first to recognize the advantages of placing a wing at a more aeronautically efficient angle.

For this reason, claim 8 has been amended to clarify that the "wing configured to generate a vortex positioned in the duct at an angle of from about 5 degrees to about 20 degrees from parallel to the outer surface of the duct in the direction of travel of the combustion exhaust gas through the duct". Without this reduced angle of attack, the plate, wing or disc "stalls" and acts merely as an inefficient obstruction in the duct causing disordered turbulence. The drawbacks to such design are two-fold. First, the disordered turbulence and steep angle of attack result in reduced flow of gas through the fluid passageway requiring the system fans to work harder to force the combustion gas through the duct. This is inefficient and costly.

Second, a disordered and turbulent airflow is not conductive to thorough mixing of the injection mixture with the combustion gas. Unpredictable airflows cannot predictably reduce or eliminate roping flows that impair effective mixing. The present invention, by providing a wing at a lower angle of attack relative to the flow of combustion gas in the duct, generates lift and is not in a "stall" condition. The result is a predictable and ordered vorticity, improved mixing of the injection mixture with the combustion gas and efficient flow of the combustion gas through the duct.

Applicant respectfully submits that neither the SRC nor the '629 teach, disclose or suggest Applicant's wing configured to generate a vortex positioned in the duct at an angle of from about 5 degrees to about 20 degrees from parallel to the outer surface of the duct in the direction of travel of the combustion exhaust gas through the duct. For this reason, Applicant requests the Examiner to reconsider and withdraw the rejection of claim 8 under 35 U.S.C. § 102 and pass claim 8 to issue.

With respect to the Examiner's reasons for rejection of claims 9-20, Applicant respectfully submits that claims 9-20 provide additional points of novelty and include all the limitations of base claim 8 and any intervening claims, which, for the reasons stated above and incorporated herein by reference, include limitations that are not disclosed in the SRC or '629 references cited by the Examiner. For this reason, Applicant respectfully submits that claims 9-20 are not anticipated and requests that the Examiner withdraw the rejection based on 35 U.S.C. § 102 and pass these claims to issue.

With respect to claims 5 and 21-24, Applicant further submits that the prior art cited by the Examiner does not teach, disclose or suggest placing the nozzle adjacent a point on the wing where the wing is configured to shed the vortex. In fact, the SRC and '629 disclose placing the nozzle directly behind the middle of the plate or disc. The present invention obtains greater mixing by discharging the injection mixture directly into the vortex rather than in the disordered turbulence behind the middle of the plate or disc.

Applicant respectfully submits that neither the SRC nor '629 references teach, disclose or suggest positioning the nozzle adjacent the point on the wing where the vortex is shed. Applicant requests withdraw of the rejection based on 35 U.S.C. § 102 and allowance of claims 5 and 21-24.

Applicant submits that newly added claims dependent claims 32-37 depending from allowable base claims, discussed above, and Applicant earnestly seeks such allowance.

OTHER REFERENCES

The references cited by the Examiner but not relied on have been reviewed. However, it is Applicant's belief that none of the references, either singularly or in combination, disclose, teach, or even suggest Applicant's invention as disclosed and claimed in the present application. Thus, no further comments concerning such references are deemed necessary.

SUMMARY

It is respectfully submitted that the application, as now amended, is in condition for allowance for the reasons stated above. Therefore, it is requested that the Examiner reconsider the rejections as applicable to the claims now pending in the application and pass such claims to issue. Should the Examiner have any questions regarding this amendment, or the remarks contained herein, Applicant's attorney would welcome the opportunity to discuss this matter with the Examiner. Applicant's attorney can be reached at 214.979.3093.

To the extent that any further fees are required during the pendency of this Application, including petition fees, the Commissioner is hereby authorized to charge payment of any additional fees, including, without limitation, any fees under 37 C.F.R. §1.16 or 37 C.F.R. §1.17, to Deposit Account No. 23-3189 of Hunton & Williams (Dallas) and reference Attorney Docket No. BASI.IP2023. In the event that any additional time is needed for this filing, or any additional time in excess of that requested in a petition for an extension of time, please consider this a petition for an extension of time for any needed extension of time pursuant to 37 C.F.R. §1.136 or any other section or provision of Title 37. Applicant respectfully requests that the Commissioner grant any such petition and authorize the Commissioner to charge the Deposit Account referenced above. Please credit any overpayments to this same Deposit Account.

This amendment is intended to be a complete response to the Office Action mailed April 18, 2002.

Respectfully submitted,

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EXHIBIT "A"

(Amended) 1. A gas stream vortex mixing system for mixing gas, the gas stream vortex mixing system comprising:

a duct provided with an outer surface defining an interior passageway operable for communicating a gas;

a [at least one] wing **configured to generate a vortex and** disposed within the interior passageway of the duct **[operable for generating at least one vortex], the wing arced between a leading edge and a trailing edge of the wing**; and

a [at least one] nozzle disposed within the interior passageway of the duct, the nozzle operable to discharge a mixture into the interior passageway of the duct.

(Amended) 2. The gas stream vortex mixing system of claim 1 wherein the nozzle is disposed adjacent the **trailing edge of the** wing **at a point beyond the wing within the vortex [and operable to discharge the mixture into at least one of the vortices]** generated by the wing.

(Amended) 3. The gas stream vortex mixing system of claim 2 wherein **the [at least one]** wing disposed within the interior passageway of the duct is **configured [operable]** to generate lift.

(Amended) 4. The gas stream vortex mixing system of claim 3 wherein **the [at least one]** wing is **configured**

[operable] to shed **the** **[at least one]** vortex at a point on the **trailing edge of the** wing.

(Amended) 5. The gas stream vortex mixing system of claim 4 wherein **the** **[at least one]** nozzle is positioned adjacent **a first end of the trailing edge of the** **[one end the point on at least one]** wing where the vortex is shed.

(Amended) 6. The gas stream vortex mixing system of claim 4 wherein **the** **[at least one]** wing is suspended within the interior passageway of the duct.

(Amended) 7. The gas stream vortex mixing system of claim 4wherein the duct is provided with an inner surface further defining the interior passageway and wherein **the** **[at least one]** wing is attached to the inner surface of the duct and **extends** **[extending therefrom]** into the interior passageway of the duct.

(Amended) 8. A gas stream vortex mixing system for mixing combustion exhaust gas, the gas stream vortex mixing system comprising:

a duct provided with an outer surface defining an interior passageway operable for communicating a combustion exhaust gas;

a [at least one] wing **configured to generate a vortex positioned in the duct at an angle of from about 5 degrees to about 20 degrees from parallel to the outer surface of the duct in the direction of travel of the combustion exhaust gas through the duct [disposed within the interior passageway of the duct operable for generating a vortex]**; and

a [at least one] nozzle disposed adjacent the wing within the interior passageway of the duct, the nozzle operable to discharge a mixture into the vortex generated by the wing.

(Amended) 9. The gas stream vortex mixing system of claim 8 wherein **the [at least one]** wing disposed within the interior passageway of the duct is **configured [operable]** to generate lift.

(Amended) 11. The gas stream vortex mixing system of claim 9 wherein **the [at least one]** wing is **further defined as** a cambered wing.

(Amended) 12. The gas stream vortex mixing system of claim 9 wherein **the** **[at least one]** wing is **further defined as** a substantially arcuate shaped airfoil.

(Amended) 13. The gas stream vortex mixing system of claim **9** **[12]** wherein **the wing is further defined as a cambered wing having a chord line defined as a substantially straight line extending from the leading edge to the trailing edge of the cambered wing and a camber line defined as a substantially arced line extending from the leading edge to the trailing edge of the** **[at least one substantially arcuate shape relates to a camber line of a]** cambered wing.

(Amended) 14. The gas stream vortex mixing system of claim 13 wherein **the** **[at least one]** wing is constructed of a substantially rigid material.

(Amended) 15. The gas stream vortex mixing system of claim 14 wherein the rigid material is sheet metal.

(Amended) 16. The gas stream vortex mixing system of claim 9 wherein **the** **[at least one]** wing is further defined as an airfoil provided with a camber line **defined as a substantially arced line extending from the leading edge to the trailing edge of the airfoil**.

(Amended) 17. The gas stream vortex mixing system of claim 16 wherein the **airfoil** **[at least one wing]** is positioned within the interior passageway of the duct such that a chord line **a chord line defined as a**

substantially straight line extending from the leading edge to the trailing edge of the airfoil [defining a straight line extending a distance relative to a cross section of the wing] is substantially parallel to **the outer surface of the duct in the direction of flow of the combustion gas exhaust** [a line defining the direction of the flow of combustion gas within the interior passageway of the duct].

(Amended) 20. The gas stream vortex mixing system of claim 17 wherein **the airfoil** [at least one wing] is operable to shed **the** [at least one] vortex **at a point on the trailing edge** the [wing] **airfoil**.

(Amended) 21. The gas stream vortex mixing system of claim 20 wherein **the** [at least one] nozzle is positioned adjacent the point on **the trailing edge of the airfoil** [at least one wing] where the vortex is shed.

(Amended) 22. The gas stream vortex mixing system of claim 17 wherein **the** [at least one] nozzle **is positioned to discharge** [discharges] the mixture in a direction with the flow of combustion **exhaust** gas **and away from the airfoil**.

(Amended) 23. The gas stream vortex mixing system of claim **8** [22] wherein at least one nozzle is positioned adjacent **a** [the] point on **the** [at least one] wing where the vortex is shed.

(Amended) 24. The gas stream vortex mixing system of claim 17 wherein **the** **[at least one]** nozzle **is positioned to discharge** **[discharges]** the mixture in a direction against the flow of combustion **exhaust** gas **and toward the airfoil**.

(New) ~~32~~ 43. The gas stream vortex mixing system of claim 8, wherein the wing is arced between a leading edge and a trailing edge of the wing along an upper surface of the wing.

(New) ~~33~~ 44. The gas stream vortex mixing system of claim 8, wherein the wing is arced between a leading edge and a trailing edge of the wing along both an upper and a lower surface of the wing.

(New) ~~34~~ 45. The gas stream vortex mixing system of claim 8, wherein the wing is positioned in the duct at an angle of from about 5 degrees to about 15 degrees from parallel to the outer surface of the duct in the direction of travel of the combustion exhaust gas through the duct.

(New) ~~35~~ 46. The gas stream vortex mixing system of claim 8, wherein the wing is positioned in the duct at an angle of from about 8 degrees to about 12 degrees from parallel to the outer surface of the duct in the direction of travel of the combustion exhaust gas through the duct.

(New) ~~36~~ 47. The gas stream vortex mixing system of claim 1, further comprising:

a plurality of wings configured to generate vortices and disposed within the interior passageway of the duct, each of the plurality of wings arced between a leading edge and a trailing edge of each of the plurality of wings.

(New) ~~37~~ 48. The gas stream vortex mixing system of claim 8, further comprising:

a plurality of wings configured to generate vortices positioned in a spaced apart relationship in the duct at an angle of from about 5 degrees to about 20 degrees from parallel to the outer surface of the duct in the direction of travel of the combustion exhaust gas through the duct.

EXHIBIT "B"

A gas stream vortex mixing system for mixing gas is provided. The gas stream vortex mixing system includes a duct provided with an outer surface defining an interior passageway operable for communicating a gas. The gas stream vortex mixing system further includes at least one nozzle and at least one wing. The wing is disposed within the interior passageway of the duct and is operable for generating at least one vortex. The nozzle is disposed within the interior passageway of the duct. The nozzle is operable to discharge a mixture into the interior passageway of the duct. **[The present invention provides a method of mixing gas by creating a predictable and ordered vorticity. The method includes providing the gas stream vortex mixing system and providing a supply of combustion gas into the interior passageway of the duct such that the combustion gas passes about at least one of the wings of the gas stream vortex mixing system generating a vortex. The method further includes discharging the mixture from at least one nozzle into the vortex such that the mixture is homogenized with the combustion gas within the vortex.]**